I' Cont. 45

implementing protocols for bi-directionally linking with the ATM backplane, said ARICs being adapted to operate on a multiple access protocol so as to provide point-to-point radio access between base stations over intercell links, and whereby the system can be scaled by adding ARICs to said ATM backplane as required to meet demand.

I' Cont. 46

48. (Amended) The broadband wireless system defined in Claim 45 wherein one of said base stations includes said ATM backplane and a network manager for configuring the operating frequencies, establishing modulation rate and establish a selected forward error correction (FEC) value and sets the transmission power levels for the users thereof.

R E M A R K S

Claims 26, 32, 34, 45, 45 and 48 have been amended. Claims 46 and 47 have been cancelled. Claims 26 - 45 and 48 are pending in the application.

Claims 26, 34 and 42 have been amended to delete the word "direct." While it is applicant's position that the word is not new matter and it is the applicant's view that the word "direct" is the same as the phrase "point to point," nevertheless, applicants have deleted this word from the claims so that the 35 U.S.C. §112 rejection is now moot.

The claims have been amended to better define the term "radio interface card" or more precisely the ATM radio interface cards. As set out at page 5 of the specification:

> In a particular implementation of the multipoint radio aspect of the invention a time division multiple access (TDMA) ARIC provides downlink point to multipoint communication while frequency division multiple access (FMDA) ARICs provide the uplink, point to point access. According to the present invention FMDA ARICs are also used for the intercell radio links.

Thus, claims 34 *et seq* have been amended to recite that the radio interface cards are selectively of one type or the other, namely, FDMA or TDMA.

Traversal of the Prior Art Rejections

Claims 45 and 47 were rejected under 35 U.S.C. §102(e) as being anticipated by Gilbert (US 6,016,311), and this ground of rejection is respectfully traversed.

It is not clear that Gilbert discloses a "scaleable," broadband wireless system. Gilbert is directed to an adaptive time division duplexing method and apparatus for dynamic bandwidth allocation within a wireless communication system. Nothing is said in the specification, claims or the drawings about scaleability. It deals with dynamically changing time slot designations in a communication link (uplink or downlink).

Gilbert suggests nothing corresponding to or equivalent or applicants' concept of scaling a system by adding ARICs to the ATM backplane.

Figures 5 and 6 of Gilbert are reproduced in reduced form as follows:

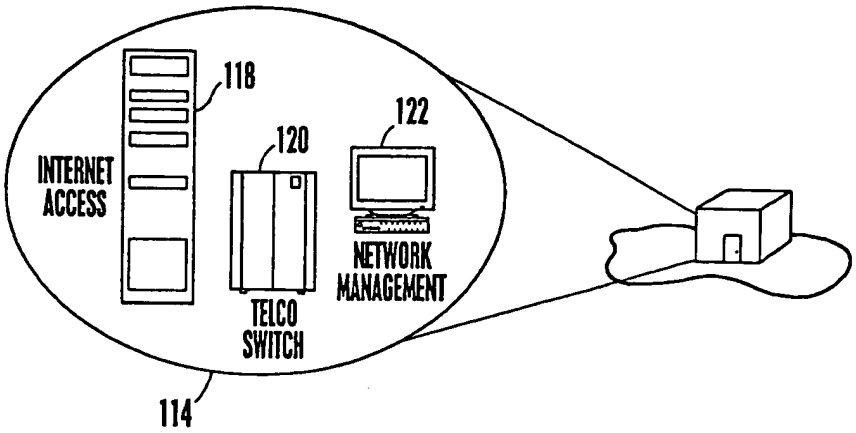

Fig. 5

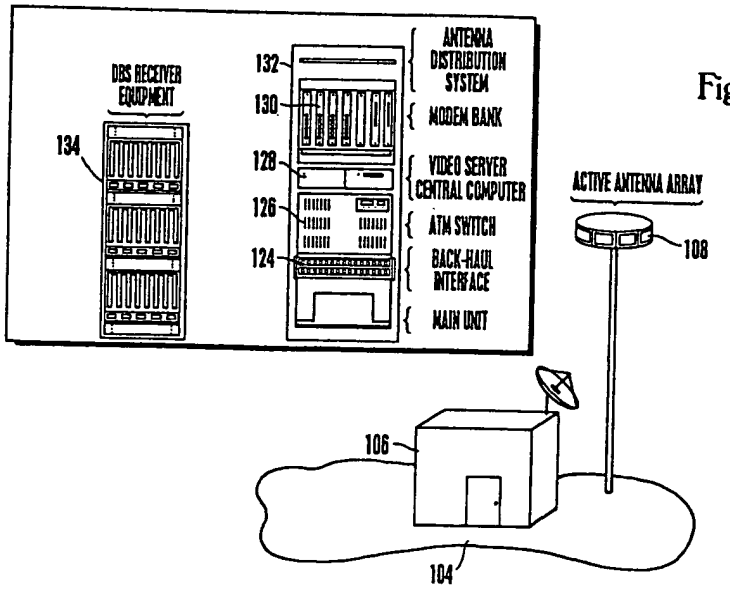

Fig. 6

The Examiner equates each of elements 118, 120, 122 (from Figure 5) and each of elements 124, 126, 128, 132 and 134 (from Figure 6) as the equivalent of applicants' ATM radio interface cards (ARICs). This cannot be because the element 118 is an internet access, element 120 is a telco switch, element 122 is a network management unit, element 124 is the backhaul interface, element 126 is the ATM switch, element 128 is the video server central computer, element 130 is a modem bank, and finally element 132 is the antenna distribution system. Manifestly, an antenna distribution system is not a modem bank, is not a video server central computer, is not an ATM switch, is not a backhaul interface, is not a network management unit, is not a telco switch, and is not an internet access. What the Examiner has done is simply selected bits and pieces out of the reference, giving them applicants' name and said they are all one and the same. Plainly, all these are different elements and have different functions in the Gilbert disclosure. They cannot possibly be the same as applicants' ATM radio interface cards.

The Examiner characterizes (more accurately mischaracterizes) the hub of Figure 5 of Gilbert as applicants' ATM backplane at one of the base stations. Manifestly, there is nothing in the reference which indicates that hub 5 is an ATM backplane or the equivalent thereof, and there is nothing in the reference which indicates that the internet access unit 118, telco switch 120, or network management unit 122 are the equivalent to applicants' ATM

radio interface cards and/or that they are provided with implementing protocols for bidirectionally linking with the ATM backplane or that the ARICs are adapted to operate on a multiple access protocol so as to provide point to point radio access between base stations over intercell links. The Examiner's contention that Gilbert is scaleable by adding internet access unit 118, or telco switches 120, or network management units 122 is ludicrous. How can an element such as network management element 122 be the equivalent of the antenna distribution system 132 of the Gilbert reference. In any of these components, 124, 126, 128, 130, 132 and 118, 120 and 122, the Examiner seems to think that Gilbert is a magician's hat from which she can pull out applicants' components. Manifestly, the 35 U.S.C. §102(e) is faulty in all material respects.

Referring to claim 47, claims 46 and 47 have been cancelled and their subject matter incorporated into claim 45. The ARIC units are, selectively, FMDA or TDMA.

Claims 26 - 28, 30, 34-35, 39, 42-43 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gilbert.

To establish obviousness based on a combination of references, there must be some motivation, suggestion, or teaching of the desirability of making the combination. *In re Kotzab*, 55 USPQ2d, 1313 (Fed. Cir. 2000). The existence of this motivation to combine is a question of fact. *Winner Intern. Royalty Corp. v. Wang*, 202 F.3d 1340, 1348, 53 USPQ2d (BNA) 1580 (Fed. Cir. 2000). The

motivation may come expressly or implicitly from the prior art, from the knowledge of persons of ordinary skill, or from the nature of the problem to be solved. The finding of obviousness must be supported by factual findings that explain why the person of ordinary skill would have selected the elements of the cited references and combined them to make the claimed invention.

The Federal Circuit has explained that the requirement of a motivation to combine is necessary to prevent findings of obviousness based improperly on "the subtle but powerful attraction" of hindsight reconstruction. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 664-64, 57 USPQ2d (BNA) 1161 (Fed. Cir. 2000). In *Ruiz*, the Federal Circuit was unable to determine where the district court had found the required motivation to combine the prior art references to arrive at the claimed invention. In particular, the district court did not explain why a person of ordinary skill would refer to prior art methods that appeared to solve different problems, or why it would have been obvious to combine two references that had both been available for many years before the claimed invention was made. Each of these facts tended to imply that the invention was not obvious.

The Federal Circuit also found no motivation to combine references in *Ecolochem, Inc. v. Southern California Edison Co.*, 56 USPQ2d (BNA) 1065 (Fed. Cir. 2000), where the patented invention was a high purity water treatment process. The primary reference that the accused infringer relied on to show obviousness was widely

regarded in the relevant industry as too impractical for use on a large scale or for large volumes or for obtaining high purity deoxygenated water.

Claims 26, 34 and 42 are independent claims, and to illustrate the contrast between applicants' architecture and the architecture of Gilbert, Figure 4 of Gilbert is reproduced with applicants' Figure 7 as follows:

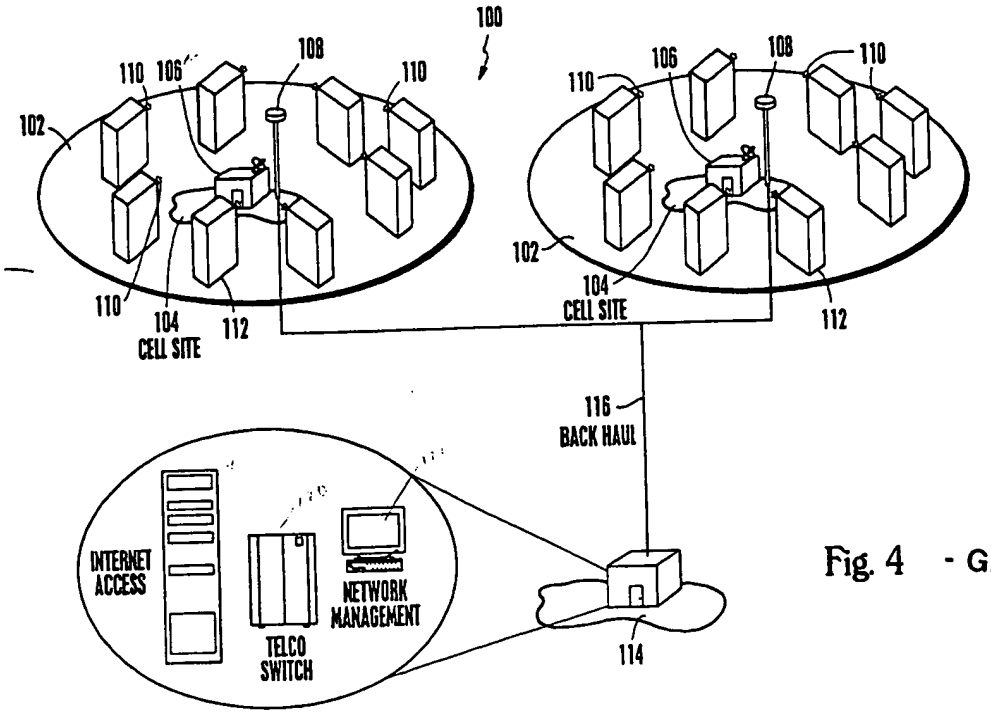

Fig. 4 - Gilbert

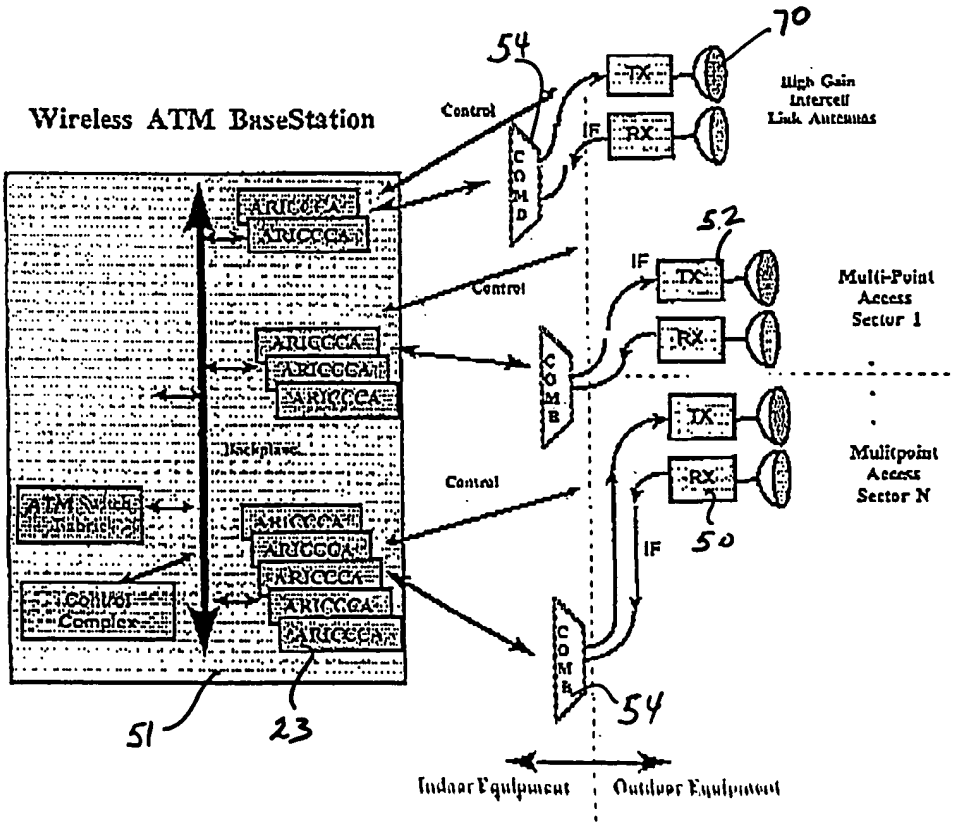

FIGURE 7 - Applicant

The text of Gilbert describing Figure 4 basically appears at columns 9 and 10 of the patent. Column 9, line 36 - column 10, line 34 are reproduced xerographically for convenience of reference and also to avoid mischaracterizing any portion thereof as follows:

As described above, the present ATDD invention is particularly useful in a broadband wireless communication system wherein the communication links in the system must adapt their uplink and downlink bandwidth allocations to accommodate the bandwidth requirements of a given service or user type. Such an exemplary wireless communication system is shown in the block diagram of FIG. **4**. In cellular communication systems, geographic areas or regions are typically divided into cells that are theoretically hexagonally shaped. The size of a cell is typically defined by the transmitting coverage of a base station which is usually centered within the cell it serves. For example, the average cell radius of the cells shown in FIG. **4** is typically between 2.5 and three kilometers. However, the operability of the present ATDD invention is not dependent upon the cell size. Rather, the present ATDD invention can be used in wireless systems having larger or smaller cells. Each cell within the system is typically allocated one or more radio frequency channels. In a frequency division multiple access (FDMA) system, adjacent or nearby cells are assigned separate frequencies.

Referring again to FIG. **4**, the wireless communication system **100** comprises a plurality of cells **102**. Each cell **102** contains an associated cell site **104** which primarily includes a base station **106** and an active antenna array **108**. Each cell **102** within the wireless communication system **100** provides wireless connectivity between the cell's base station **106** and a plurality of customer premises equipment (CPE) **110** located at fixed customer sites **112** throughout the coverage area of the cell **102**. It is presently contemplated that the users of the system **100** will be both residential and business customers, and thus will require various types of services and varying uplink/downlink bandwidth allocations. Each cell shall service approximately 1,000 residential subscribers and approximately 300 business subscribers. As shown in FIG. **4**, the cell sites **104** communicate with a communications hub **114** using a "non-radio frequency" type of communication link or "back haul" **116**. The back haul **116** preferably comprises either a fiber-optic cable or a microwave link. The communications hub **114** interfaces the wireless communication system **100** with public network service providers via one or more wired communications links (not shown).

The radio communication within a cell **102** is preferably bi-directional in nature. Information is allowed to flow in both directions between the base stations **106** and the plurality of CPEs **110**. The base station **106** preferably broadcasts multiple simultaneous high bit-rate channels. Each channel comprises different multiplexed information streams. The information in a stream includes address information which enables a selected CPE **110** to distinguish and extract the information intended for it. The wireless communication system **100** of FIG. **4** provides true "bandwidth-on-demand" to the plurality of CPE **110**. The quality of the services available to customers using the system **100** is variable and selectable. The amount of bandwidth dedicated for a given service is determined by the information rate required by that service. For example, a video conferencing service requires a great deal of bandwidth with a well controlled delivery latency. In contrast, certain types of data services are often idle (which then require zero bandwidth) and are relatively insensitive to delay variations when active. The ATDD method and apparatus of the present invention can be used in the system of FIG. **4** to facilitate the efficient delivery of both service types in addition to others.

Communications Hub

Thus, although the Examiner has equated backhaul 116 in Figure 4 of Gilbert with the intercell link defined by applicants' claims, the above replicated discussion in the Gilbert reference shows that

it is not the equivalent of applicants' intercell radio link. Note, for example, that hub 114 of Gilbert is not located physically in the cell site and that each cell site or base station 104 is in communication with the hub via an optical link. In Gilbert, the active antenna 108 is used to provide wireless communication for the sites 110 but not for point to point communication with other base stations.

Claim 31 depends from claim 30 and specifies that each of the first radio interface cards and each of the second radio interface cards communicate with the sectored antennas via one or more combiners. (See applicants' Figure 7.) Claim 31 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Gilbert as applied to claims 30 and 35 above, and further in view of Smith (US 5,432,780). The Examiner contends that it would have been obvious to implement the combiner in Smith in the Gilbert base system. First of all, we have shown above that Gilbert does not teach the features of claim 26 where there is an ATM multi-service switch equipped with a first set of radio interface cards for providing wireless communications between the base station and the network interface units and a second set of radio interface cards for providing point to point intercell radio link. Secondly, the Examiner's comment: "The motivation/suggestion for doing so is to carry out diversity combining for the signals and reduce the disadvantages caused by a fading signal." is not apt or applicable in the present case.

Claims 29, 36 and 37 stand erroneously rejected under 35 U.S.C. §103(a) as being unpatentable over Gilbert as applied to claims 30 and 35, and further in view of Pasternak (US 5,936,949). Claim 36 is directed to mode backbone for providing broadband wireless service to the network interface units, and claim 37 is directed to the network manager for receiving configuration parameters respecting the first and second radio interface cards.

Obviously, these claims are patentable for the reasons that their parent claim is patentable.

Claims 32 and 40 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gilbert further in view of Jaisingh (US 6,009,096), and this ground of rejection is respectfully traversed.

It is clear that the Examiner has arbitrarily concocted a "motivation/suggestion" for the combination which is not found in either reference.

Claims 33 and 41 were erroneously rejected as unpatentable over Gilbert as applied to claim 30, 35, and further in view of Acompora (US 6,049,593).

Claims 46 and 47 have been combined with claim 45, so the rejection thereof is moot.

Applicants respectfully submit that the Examiner's contention that it would have been obvious to a skilled artisan to apply an arbitrary motivation to Gilbert is fallacious. Note that the basic premise of Gilbert is an adaptive time division multiplexing method in apparatus for dynamic bandwidth allocation within a wireless

communication system. For example, it is not understood why one would want to change Gilbert's time division duplexing invention for a frequency division multiple access protocol. It is clear that the motivation comes not from the art but from applicants' disclosure.

Claims 48, 38 and 44 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gilbert further in view of Vary (IEEE 1989, Implementation aspects of the Pan European Digital Mobile Radio System).

Claim 48 depends from claim 45 and specifies that one of the base stations include the ATM backplane and a network manager for "configuring the operating frequencies, establishing modulation rate and establish a selected forward error correction (FEC) value and sets the transmission power levels for the users thereof." No such teaching or suggestion is found in the art relied on the Examiner.

In view of the above, further and favorable reconsideration is respectfully requested.

Respectfully submitted,

Jim Zegeer

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Attorney for Applicants

Attachment: VERSION WITH MARKINGS TO SHOW CHANGES MADE

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Date: January 13, 2003

In the event this paper is deemed not timely filed, the applicant hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 26-0090 along with any other additional fees which may be required with respect to this paper.

IN THE CLAIMS:

Claims 26, 32, 34, 42, 45 and 48 have been amended as follows:

26. (Three times amended) An interface system at a base station in a cell within a cellular wireless network for providing bi-directional wireless communications to Network Interface Units (NIUs) within the cell and for providing a point to point [direct] inter-cell radio link for communicating with a base station in a neighboring cell comprising; an asynchronous transfer mode (ATM) multi-services switch equipped with a first one or more radio interface card for providing wireless communications between the base station and the NIUs and a second one or more radio interface card for providing the [direct] point to point inter-cell radio link.

32. (Twice Amended) An interface system as [define] defined in claim 25 wherein said inter-cell radio link between respective base stations is in a ring configuration, wherein one of the base stations is connected to said ATM network and the network manager, and each of said other base stations is in bidirectional communication with said one base station over inter-cell radio links.

34. (Three times amended) A base station in a cell of a cellular, wireless communications network for providing wireless, bi-directional communication with network interface units (NIUs) within the cell and for providing a point to point [direct] inter-cell radio link with a base station in a neighboring cell, the base station having an asynchronous transfer mode (ATM) multi-services switch equipped with a first radio interface card for providing the wireless, bi-directional communication between the base station and the NIUs and a second interface card for providing the [direct] point to point radio inter-cell link, said radio interference cards being, selectively, one of the following: frequency division multiple access (FDMA) or time division multiple access (TDMA).

42. (Three times amended) A method of providing communications between base stations in a cellular, wireless network having multiple cells, each of the multiple cells having a base station, the method comprising providing an asynchronous transfer mode (ATM) multi-services switch at each of the base stations, each switch being equipped with a radio interface card for providing [direct] point to point bi-directional communication with other base stations in the network; providing a network manager in association with at least one of the base stations for configuring the radio interface cards, and providing a directional antenna for each multi-services switch to support point to point

bi-directional communication between base stations over a [direct] radio inter-cell link.

45. (Amended) A scaleable, broadband wireless system for providing radio access to a metropolitan area comprising: a plurality of overlapping cell areas, each cell area having a base station and a plurality of fixed user sites having network interface units (NIUs) within each cell area,

ATM radio interface cards (ARICs) in each base station for implementing wireless, bi-directional communication between said base stations and user sites, <u>each said ARICs being adapted to operate selectively on frequency division multiple access (FDMA) protocol, or two time division multiple access (TDMA) protocol</u>.

an ATM backplane at one of said base stations constituted by a plurality of ARICs, each base station ARICs being provided with implementing protocols for bi-directionally linking with the ATM backplane, said ARICs being adapted to operate on a multiple access protocol so as to provide point-to-point radio access between base stations over intercell links, and whereby the system can be scaled by adding ARICs to said ATM backplane as required to meet demand.

48. (Amended) The broadband wireless system defined in Claim 45 wherein one of said base stations includes said ATM backplane and a network manager for configuring the operating frequencies, establishing modulation rate and establish a selected forward error

correction (FEC) value and sets the [transmit and] transmission power levels for the users thereof.